Retrospective epidemiological study of pyometra in dogs and cats treated at the veterinary hospital of UEM - data from 2015 to june 2021

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Pietra Rocha Teixeira
Anna Beatriz Ribeiro Recchia
Patricia Marques Munhoz

1 INTRODUCTION

Pyometra is the name given to the inflammatory process and accumulation of mucopurulent secretion in the uterine lumen, caused by a cystic hyperplasia (CABRAL et al., 2016) due to an extensive hormonal influence (CHEN, ADDEO, SASAKI, 2007), concomitant with a bacterial infection. It can affect several species, but is more commonly observed in middle-aged dogs (CABRAL et al., 2016), with a higher rate of occurrence between 7 and 9 years. The incidence can reach 199 dogs per 10,000 animals and 17 cats per 10,000 animals (HAGMAN, 2018). It is one of the most common uteropathies in the veterinary routine (GARCIA FILHO et al., 2012) and its importance is related to its severity. In the meantime, both its diagnosis and early treatment guarantee a good prognosis, especially in cases of closed pyometra, when there is a high risk of septicemia with evolution to death (OLIVEIRA et al, 2017).

The etiologic agent most related to this pathology is the bacterium Escherichia coli, with high affinity for the tissues of the urinary tract, endometrium and myometrium of dogs (SANDHOLM, VASENIUS, KIVISTO, 1975). Its endotoxins cause various clinical manifestations of varying degrees of severity, such as kidney damage, medullary immunosuppression and hepatic cholestasis (CONRADO, 2009). Pyometra manifests itself during the diestrous phase, also called the luteal phase, when there is a peak in the production of the hormone progesterone. In this phase, due to this hormonal imbalance, there is an inhibition of myometrial activity, resulting in fluid retention in the uterine lumen, which predisposes to the appearance of the condition (NELSON, COUTO, 2015). The three main causes of pyometra reported in the scientific literature are: repeated estrous cycles (increasing blood progesterone), use of injectable contraceptives and opportunistic infections of infectious agents that ascend through the cervix towards the uterus (DYBA et al, 2021; OLIVEIRA et al, 2019).

Pyometra can be classified as open or closed, depending on the presence or absence of vaginal discharge. Cases considered as closed are more severe precisely because of the absence of more

specific clinical manifestation, and the diagnosis is usually established through the presence of vaginal discharge, uterine distension and abdominal pain (HAGMAN, 2018). However, other clinical signs may also be associated, such as inappetence, lethargy, tachycardia, tachypnea, anorexia, diarrhea, polydipsia, polyuria, vomiting, fever, dehydration and weight loss, along with uterine enlargement perceived through palpation - which must be performed delicately so that there is no uterine rupture - especially in these cases of closed pyometra (NELSON; COUTO, 2015).

The preliminary diagnosis of the occurrence should be proposed through the animal's history and general physical examination. For differential diagnosis, gynecological examinations, complete blood counts and the use of abdominal ultrasound as the main tool are recommended (HAGMAN, 2018). Ultrasonography has the advantage of detecting intrauterine fluid (anechoic to hypoechoic fluid), as well as exposing the size of the uterus, also pointing out possible pathologies in the tissues of the uterus and ovary (CABRAL et al, 2016).

The treatment of choice is ovariohysterectomy (OVH), especially in cases of closed pyometra. Antibiotic therapy is also prescribed (DYBA et al, 2021), which should be extended for a few days postoperatively, in addition to an accurate and continuous assessment (HAGMAN, 2018). However, depending on the condition of the cervix, treatment can be given clinically (OLIVEIRA et al 2017). Although it has a good prognosis and the mortality rate is low (from 3% to 20%) (TRAUTWEIN et al, 2018), there is still a risk of developing complications or systemic problems, such as peritonitis, sepsis, uterine rupture, inflammatory response syndrome, endotoxemia, acute renal failure, with the possibility of evolution to death (HAGMAN, 2018; CABRAL et al 2016; OLIVEIRA et al, 2017; OLIVEIRA et al, 2019).

In view of the information presented, based on some aspects not yet so well elucidated about the various predisposing factors, the association with the immune response and its possible bacteriological characterization (SANTANA, SANTOS, 2021), added to the scarcity of epidemiological data on pyometra in the Umuarama-PR region, it is important to study and observe this pathology, enabling the establishment of a more concise pattern among the cases attended in the region. Furthermore, such compilation will help in a better understanding of its pathogenesis, enabling the determination of the best treatment and prevention protocol, in the name of a good prognosis, well-being and quality of life for patients.

2 OBJECTIVE

The present work aims to carry out an epidemiological and statistical survey regarding cases of pyometra in female and female cats that were treated at the Veterinary Hospital of the State University of Maringá. Influences related to factors such as species, age, breed, size and clinical history of these patients will be observed, in addition to the grouping of data also making it possible to verify the

follow-up and consequent outcome of the cases, among other evaluations pertinent to the understanding and mapping of pyometra occurrences in these animals. In this way, it will result in greater visibility and understanding of the theme.

3 METHODOLOGY

The data collection and analysis were carried out from the records and observations present in the medical records made available by the Veterinary Hospital of UEM, based in the municipality of Umuarama / PR, which were dated from 2015 to June 2021.

The epidemiological study, therefore, was retrospective and the data collected from each individual file were transferred to a pre-established spreadsheet using the Microsoft Excel® program. This was equipped with the parameters of interest: species; breed; size (small, medium or large for dogs); age; animals never crossed; number of previous births; treatment; clinical history; form of pyometra (open or closed); need or not for surgical intervention and outcome of the disease (cure or death). Thus, it was possible to compile and evaluate the data, obtaining statistical results in the form of percentage and numerical for the most relevant variants in question.

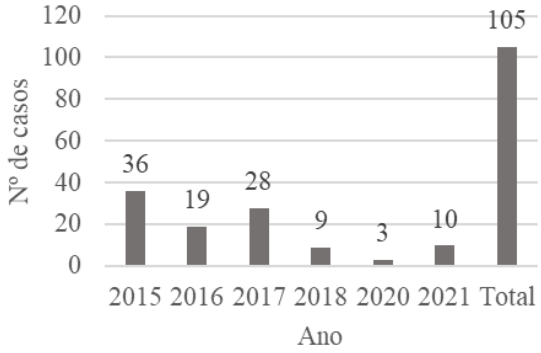
For the writing of the research, a bibliographic review was carried out, based on the analysis of pertinent data recorded in books and current scientific articles. Thus, for the search of bibliographic sources, the databases ScienceDirect, Scientific Electronic Library Online (SciELO), Mendeley, ReserchGate, Scholar Google, CAPES Journals Portal, university journals and PubMed were used and, as a criterion, data from the literature that mostly date back to the last five years were prioritized. The discussion addresses the results obtained, establishing comparisons with existing data from similar scientific research and made available so far.

4 DEVELOPMENT

The research was carried out by gathering 4,050 care records filed since 2015 at the Veterinary Hospital of the State University of Maringá to be analyzed and filtered into records of interest, in retrospect, evaluating the following parameters: year of occurrence, species, breed, size, age, breeding history, calving history, form of pyometra, whether there was a surgical approach and outcome of the case. Such parameters were selected in order to obtain a comprehensive notion about the occurrence of this condition in the region of Umuarama-PR, as well as the measures taken and their prognosis.

Of the 4,050 attendance records, only 105 were of interest to this research. These were 36 from 2015, 19 from 2016, 28 from 2017, 9 from 2018, 3 from 2020 and 10 from 2021, as shown in Graph 1 below.

Graph 1. Number of pyometra cases per year, according to analysis of care records.



The 2019 forms were archived in an online manner and the data were lost due to a network and storage failure. Therefore, these were not included in the study. The drop in the number of cases in 2020 and 2021 was due to the social isolation and temporary closure of the Veterinary Hospital of the State University of Maringá due to the global Covid-19 pandemic.

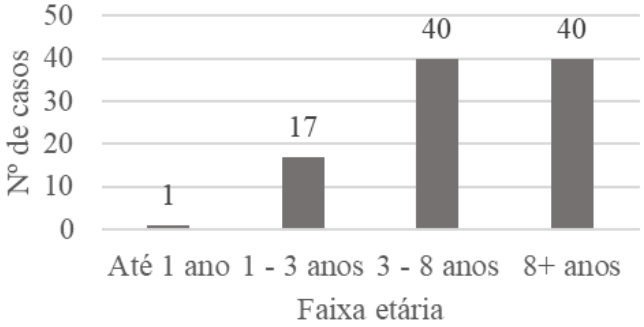
Out of the total number of cases that were reported (105), 98 cases were in female dogs, resulting in a total of 93.33% and only 7 were reported in female cats, representing the remaining 6.66%. The information regarding female and male cats will be divided for a better understanding and arrangement in the study.

Dogs

Within the total number of cases (98), 51 of them (52.04%) were in female dogs without defined breed (SRD), and 47 (47.95%) in female dogs of defined breed, with no predominant breed in the incidents. In the size parameter, the main one was in small animals, with a total of 45 cases (45.91%). In medium-sized animals, there were 20 cases (20.40%) and in large-sized animals, 33 cases (33.67%).

For age, the main ranges were between 3 and 8 years and animals over 8 years. All age-related data are shown in Graph 2 below. Only one case (1.02%) of pyometra was found in dogs up to 1 year of age, 17 cases (17.34%) in the range of 1 and 3 years, 40 cases (40.81%) in dogs aged between 3 and 8 years, and 40 cases (40.81%) in dogs over 8 years.

Graph 2. Number of pyometra cases for each age group.



Regarding the parameters of occurrence of birth and crossbreeding, in 41 cases (41.83%) the owner could not inform if it occurred in any copulation during the life of the dogs, 24 cases (24.48%) were reported without any crossbreeding and in 33 dogs (33.69%), the guardians reported that there was, at some point, coitus. Among the total number of cases, 45 (45.91%) had no information on previous births, 33 dogs (33.69%) had never given birth during their lifetime and only 20 (20.40%) had already had a pregnancy during their lifetime.

Regarding the specification of the form of pyometra, 41 (41.83%) dogs presented the closed form of the problem and 57 (58.16%) the open form. In addition, 90 (91.83%) of the total cases had surgical intervention through ovariohysterectomy and only 8 (8.16%) were treated conservatively.

For the outcome, 90 (91.83%) animals were cured of the disease, 4 (4.08%) dogs died and 4 (4.08%) had no relevant information for this case study.

Gatas

Within the total number of cases in female cats (7), 5 (71.42%) were non-defined breed (SRD) and 2 (28.57%) were Siamese, all in the age range of 3 to 8 years. Regarding the form of pyometra, 4 patients (57.14%) had the open form and 3 (42.85%) the closed form. Regarding surgical intervention, only one cat (14.28%) had conservative treatment, all the other 6 (85.71%) were referred for ovariohysterectomy. In all cases, the outcome was cure of the disease.

The lack of data for cats is due to the lack of information in the patient history sheet.

5 DISCUSSION

In view of the results obtained, the mean age found in the affected dogs was 6.66 years, a result similar to that observed in the study by Dyba et al. (2021), in the southwestern region of Paraná, where the author points out an average age of 6.65 ± 1.02 years in the cases evaluated. In this same study, the author also mentions that 81.83% of the patients presented the open form of pyometra, thus composing the majority of the analyzed casuistry, as was also observed in the present study.

In a second study by Borges et al. (2021), all cases that received a diagnosis of pyometra were referred to the ovariohysterectomy procedure, as well as the study by Dyba et al. (2021), where 85.71% of the animals had the same treatment. Such information ratifies the study presented here, and is consistent with Silva (2018), who points out that the use of this technique eliminates the focus of origin of the disease, in this case the female reproductive system, and prevents recurrences, being, therefore, the treatment of choice for pyometra.

Also in the study presented by Borges et al. (2021), female dogs without a defined breed made up the majority of the sample evaluated, as was reported in this research, and also as the author points out to have occurred in other studies carried out in Brazil.

6 FINAL CONSIDERATIONS

In view of the results obtained, it is concluded that female dogs and cats from 3 years are the most affected by the problem, being the average age 6 to 7 years, in the case of female dogs. It is also found that there is no predominant breed that has some predisposition, and most of the patients registered here do not have a defined breed. Given the results obtained with ovariohysterectomy, it is confirmed that this is still considered the gold standard treatment for the cure of pyometra, also serving as a prophylactic method, and that the most frequent way of this is the open form of the disease. In addition, little is known about the interaction between crosses and calving and the disease itself.

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